

**Energy saving startup circuit for power supply**

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**FIELD OF THE INVENTION**

This invention relates to startup circuits for driving low voltage equipment such as light emitting diodes (LEDs).

**BACKGROUND OF THE INVENTION**

5 Electrical equipment requiring low voltage DC are frequently energized by mains operated power supplies. Fig. 1 shows schematically a conventional startup circuit 1 in a typical low voltage power supply, wherein mains voltage 2 is rectified typically by a bridge rectifier 3 and then fed via a resistor 4 to a control circuit (not shown) in the power supply. The input voltage to the control circuit is maintained at  
10 a required level by a zener diode 5 connected in parallel with a capacitor 6.

During operation, the resistor 4, which will be referred throughout as a "starting resistor", feeds current to the capacitor 6 which therefore charges to a value determined by the zener diode 5, thus ensuring a constant voltage input to the control circuit. Typically, the mains voltage is 110 VAC in the USA or 220 VAC in  
15 Europe, while the equipment operates on a much lower voltage, such as 30 volts or even less. The startup circuit 1 serves to energize the power supply directly from the mains supply after it is first switched on in a controlled manner. However, once the power supply is operating and has reached a steady state voltage, there is no longer any need to supply energy to the starting circuit, which is now redundant.